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Attachment to

2 March 1967

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AIR LIQUEFACTION PLANTS  
PRODUCERS OF GASEOUS & LIQUID OXYGEN & NITROGEN FOR  
MISSILES & INDUSTRY IN THE USSR & CHINA

1. SIGNIFICANCE:  
EXAMPLES OF SOVIET LIQUEFACTION PRODUCTION  
FACILITIES RELATED TO MISSILES AND INDUSTRY  
WHICH HAVE BEEN IDENTIFIED ON PHOTOGRAPHY.
2. LOCATION:

A. DNEPROPETROVSK	INDUSTRY
B. MINSK	INDUSTRY
C. LVOV	INDUSTRY
D. STERLITAMAK	INDUSTRY
E. KRASNOYARSK	MISSILES
F. KAPUSTIN YAR	MISSILES
3. REMARKS:  
A. LIQUID OXYGEN, COMMONLY REFERRED TO AS  
LOX, IS PROBABLY THE BEST KNOWN AND MOST  
IMPORTANT OF THE OXIDIZERS. IT WAS USED BY  
THE GERMANS IN WORLD WAR II V-2 MISSILES AND  
IS NOW USED EXTENSIVELY IN THE USA AND THE  
USSR.

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FOR INDUSTRIAL PURPOSES GASEOUS OXYGEN  
IS PREFERABLE.

B. LIQUID OXYGEN IS PRODUCED BY THE REPEATED  
COMPRESSION, COOLING AND SUBSEQUENT LIQUE-  
FACTION OF AIR. THE LIQUID AIR IS THEN FRAC-  
TIONATED INTO LIQUID NITROGEN AND LIQUID OXYGEN -  
OR THE LIQUID NITROGEN MAY BE SEPARATED FROM  
THE LIQUID OXYGEN BY SIMPLE EVAPORATION.

THE IDENTIFICATION OF A LIQUID OXYGEN  
PRODUCTION PLANT MAY BE QUITE DIFFICULT SINCE  
ALL PROCESSING EQUIPMENT AND LOADING DOCKS MAY  
BE INSTALLED WITHIN THE BUILDING. EXTERNAL  
FEATURES SUCH AS LISTED BELOW HAVE ASSISTED IN  
THE IDENTIFICATION OF THE SITES DEPICTED ON  
THIS BRIEFING BOARD. ▲

- 1) LARGE SUBSTATION
- 2) STORAGE TANKS
- 3) DISTILLATION OR FRACTIONATING TOWERS
- 4) AIR INTAKE STRUCTURES
- 5) LOADING PLATFORMS OR DOCKS
- 6) WATER STORAGE TANKS

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- 7) WATER COOLING TOWERS OR TRAYS
- 8) INSULATED DOUBLE-WALL TANKS (KEYHOLE SHAPED)
- 9) GASHOLDERS
- 10) HIGH BAY PRODUCTION BUILDINGS

4. COLLATERAL:

FID TOWN AND PLANT FOLDERS ARE USED EXTENSIVELY AS INDICATORS FOR LOCATION OF CRYOGENIC PRODUCTION FACILITIES.

5. COMMENT:

OF THE SIX FACILITIES DEPICTED ON THE BRIEFING BOARD, 3 OF THESE FACILITIES HAVE BEEN KNOWN TO BE CRYOGENIC PRODUCERS FOR SOME TIME (MINSK, LVOV AND KRASNOYARSK) WHILE THE FACILITIES AT DNEPROPETROVSK, STERLITAMAK, AND KAPUSTIN YAR ARE VERY RECENTLY CONFIRMED CRYOGENIC PRODUCTION FACILITIES.

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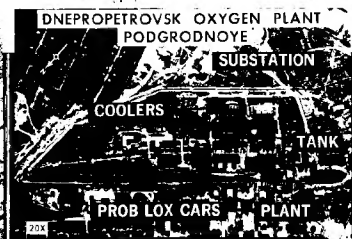
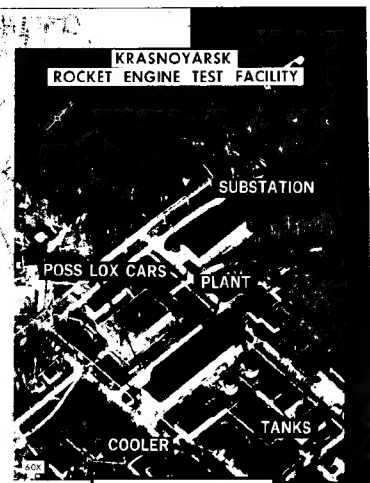
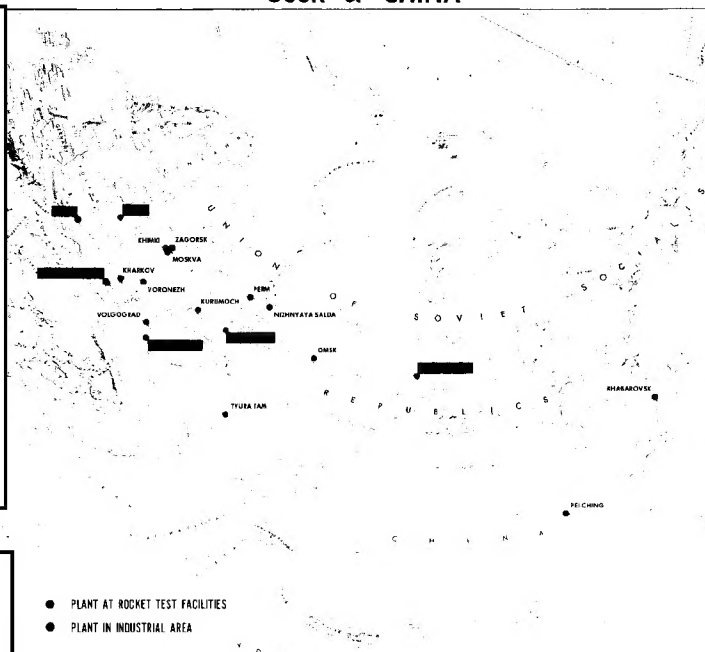
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# AIR LIQUEFACTION PLANTS

PRODUCERS OF GASEOUS AND LIQUID OXYGEN AND NITROGEN FOR ROCKETS AND INDUSTRY  
USSR & CHINA



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